

Technicolor

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The latest unpublished results are described in “Dynamical Electroweak Symmetry Breaking” review.

MASS LIMITS for Resonances in Models of Dynamical Electroweak Symmetry Breaking

<u>VALUE (GeV)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •				
>805	95	1 BAAK	12 RVUE	QCD-like technicolor
>805	95	2 AALTONEN	11AD CDF	top-color Z'
none 208–408	95	2 AALTONEN	11AE CDF	top-color Z'
>280	95	3 CHIVUKULA	11 RVUE	top-Higgs
>207	95	4 CHIVUKULA	11A RVUE	techni- π
none 90–206.7	95	5 AALTONEN	10I CDF	$p\bar{p} \rightarrow \rho_T/\omega_T \rightarrow W\pi_T$
>600	95	6 ABAZOV	10A D0	$\rho_T \rightarrow WZ$
none 350–440	95	7 ABAZOV	07I D0	$p\bar{p} \rightarrow \rho_T/\omega_T \rightarrow W\pi_T$
none 260–480	95	8 ABULENCIA	05A CDF	$\rho_T \rightarrow e^+e^-, \mu^+\mu^-$
none 260–480	95	9 CHEKANOV	02B ZEUS	color octet techni- π
>600	95	10 ABAZOV	01B D0	$\rho_T \rightarrow e^+e^-$
none 350–440	95	11 ABDALLAH	01 DLPH	$e^+e^- \rightarrow \rho_T$
none 260–480	95	12 AFFOLDER	00F CDF	color-singlet techni- ρ , $\rho_T \rightarrow W\pi_T, 2\pi_T$
none 260–480	95	13 AFFOLDER	00K CDF	color-octet techni- ρ , $\rho_{T8} \rightarrow 2\pi_{LQ}$
none 260–480	95	14 ABE	99F CDF	color-octet techni- ρ , $\rho_{T8} \rightarrow b\bar{b}$
none 260–480	95	15 ABE	99N CDF	techni- ω , $\omega_T \rightarrow \gamma b\bar{b}$
none 260–480	95	16 ABE	97G CDF	color-octet techni- ρ , $\rho_{T8} \rightarrow 2\text{jets}$

1 BAAK 12 give electroweak oblique parameter constraints on the QCD-like technicolor models. See their Fig. 28.

2 AALTONEN 11AD and AALTONEN 11AE search for top-color Z' decaying to $t\bar{t}$. The quoted limit is for Z'_{top} with decay width $\Gamma = 0.012 M_{Z'}$.

3 Using the LHC limit on the Higgs boson production cross section, CHIVUKULA 11 obtain a limit on the top-Higgs mass > 300 GeV at 95% CL assuming 150 GeV top-pion mass.

4 Using the LHC limit on the Higgs boson production cross section, CHIVUKULA 11A obtain a limit on the techni-pion mass ruling out the region $110 \text{ GeV} < m_P < 2m_t$. Existence of color techni-fermions, top-color mechanism, and $N_{TC} \geq 3$ are assumed.

5 AALTONEN 10I search for the vector techni-resonances (ρ_T, ω_T) decaying into $W\pi_T$ with $W \rightarrow \ell\nu$ and $\pi_T \rightarrow b\bar{b}, b\bar{c}$, or $b\bar{u}$. See their Fig. 3 for the exclusion plot in $M_{\pi_T} - M_{\rho_T}$ plane.

6 ABAZOV 10A search for a vector techni-resonance decaying into WZ . The limit assumes $M_{\rho_T} < M_{\pi_T} + M_W$.

7 ABAZOV 07I search for the vector techni-resonances (ρ_T, ω_T) decaying into $W\pi_T$ with $W \rightarrow e\nu$ and $\pi_T \rightarrow b\bar{b}$ or $b\bar{c}$. See their Fig. 2 for the exclusion plot in $M_{\pi_T} - M_{\rho_T}$ plane.

8 ABULENCIA 05A search for resonances decaying to electron or muon pairs in $p\bar{p}$ collisions. at $\sqrt{s} = 1.96$ TeV. The limit assumes Technicolor-scale mass parameters $M_V = M_A = 500$ GeV.

9 CHEKANOV 02B search for color octet techni- π P decaying into dijets in $e p$ collisions. See their Fig. 5 for the limit on $\sigma(ep \rightarrow ePX)B(P \rightarrow 2j)$.

10 ABAZOV 01B searches for vector techni-resonances (ρ_T, ω_T) decaying to e^+e^- . The limit assumes $M_{\rho_T} = M_{\omega_T} < M_{\pi_T} + M_W$.

11 The limit is independent of the π_T mass. See their Fig. 9 and Fig. 10 for the exclusion plot in the $M_{\rho_T} - M_{\pi_T}$ plane. ABDALLAH 01 limit on the techni-pion mass is $M_{\pi_T} > 79.8$ GeV for $N_D=2$, assuming its point-like coupling to gauge bosons.

12 AFFOLDER 00F search for ρ_T decaying into $W\pi_T$ or $\pi_T\pi_T$ with $W \rightarrow \ell\nu$ and $\pi_T \rightarrow b\bar{b}, b\bar{c}$. See Fig. 1 in the above Note on “Dynamical Electroweak Symmetry Breaking” for the exclusion plot in the $M_{\rho_T} - M_{\pi_T}$ plane.

13 AFFOLDER 00K search for the ρ_{T8} decaying into $\pi_{LQ}\pi_{LQ}$ with $\pi_{LQ} \rightarrow b\nu$. For $\pi_{LQ} \rightarrow c\nu$, the limit is $M_{\rho_{T8}} > 510$ GeV. See their Fig. 2 and Fig. 3 for the exclusion plot in the $M_{\rho_{T8}} - M_{\pi_{LQ}}$ plane.

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- 14** ABE 99F search for a new particle X decaying into $b\bar{b}$ in $p\bar{p}$ collisions at $E_{\text{cm}}=1.8$ TeV. See Fig. 7 in the above Note on “Dynamical Electroweak Symmetry Breaking” for the upper limit on $\sigma(p\bar{p} \rightarrow X) \times B(X \rightarrow b\bar{b})$. ABE 99F also exclude top gluons of width $\Gamma=0.3M$ in the mass interval $280 < M < 670$ GeV, of width $\Gamma=0.5M$ in the mass interval $340 < M < 640$ GeV, and of width $\Gamma=0.7M$ in the mass interval $375 < M < 560$ GeV.
- 15** ABE 99N search for the techni- ω decaying into $\gamma\pi_T$. The technipion is assumed to decay $\pi_T \rightarrow b\bar{b}$. See Fig. 2 in the above Note on “Dynamical Electroweak Symmetry Breaking” for the exclusion plot in the $M_{\omega_T} - M_{\pi_T}$ plane.
- 16** ABE 97G search for a new particle X decaying into dijets in $p\bar{p}$ collisions at $E_{\text{cm}}=1.8$ TeV. See Fig. 5 in the above Note on “Dynamical Electroweak Symmetry Breaking” for the upper limit on $\sigma(p\bar{p} \rightarrow X) \times B(X \rightarrow 2j)$.

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 REFID=47573
 REFID=47752
 REFID=46728
 REFID=47211
 REFID=45343

REFERENCES FOR Technicolor

BAAK	12	EPJ C72	2003	M. Baak <i>et al.</i>	(Gfitter Group)
AALTONEN	11AD	PR D84	072003	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AALTONEN	11AE	PR D84	072004	T. Aaltonen <i>et al.</i>	(CDF Collab.)
CHIVUKULA	11	PR D84	095022	R.S. Chivukula <i>et al.</i>	
CHIVUKULA	11A	PR D84	115025	R. S. Chivukula <i>et al.</i>	
AALTONEN	10I	PRL	104 111802	T. Aaltonen <i>et al.</i>	(CDF Collab.)
ABAZOV	10A	PRL	104 061801	V.M. Abazov <i>et al.</i>	(D0 Collab.)
ABAZOV	07I	PRL	98 221801	V.M. Abazov <i>et al.</i>	(D0 Collab.)
ABULENCIA	05A	PRC	95 252001	A. Abulencia <i>et al.</i>	(CDF Collab.)
CHEKANOV	02B	PL	B531 9	S. Chekanov <i>et al.</i>	(ZEUS Collab.)
ABAZOV	01B	PRL	87 061802	V.M. Abazov <i>et al.</i>	(D0 Collab.)
ABDALLAH	01	EPJ	C22 17	J. Abdallah <i>et al.</i>	(DELPHI Collab.)
AFFOLDER	00F	PRL	84 1110	T. Affolder <i>et al.</i>	(CDF Collab.)
AFFOLDER	00K	PRL	85 2056	T. Affolder <i>et al.</i>	(CDF Collab.)
ABE	99F	PRL	82 2038	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	99N	PRL	83 3124	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	97G	PR	D55 R5263	F. Abe <i>et al.</i>	(CDF Collab.)